Journal of MOLECULAR BIOLOGY

EDITOR-IN-CHIEF
J. C. KENDREW

ASSISTANT EDITOR
S. BRENNER

UNIVERSITY OF HAWAII LIBRARY

EDITORIAL BOARD
D. Baltimore
D. Branton
J. Cairns
C. R. Cantor
G. N. Cohen
D. M. Crothers
J. E. Darnell
W. F. Dove
G. von Ehrenstein
G. Felsenfeld
W. Gilbert
A. Klug
D. E. Koshland
S. Lowey
D. Nathans
D. C. Phillips
C. M. Radding
T. Staehelin
G. M. Tomkins
P. M. B. Walker

LIBRARY USE ONLY

VOLUME 71
28 October 1972 to 28 November 1972

ACADEMIC PRESS
LONDON and NEW YORK

Copyright © 1972, by Academic Press Inc. (London) Ltd.
ALL RIGHTS RESERVED
No part of this volume may be reproduced in any
form, by photostat, microfilm, or any other means,
without written permission from the publishers.

Printed in Great Britain

CONTENTS OF VOLUME 71

Number 1, 28 October 1972

Bick, M. D., Lee, C. S. and Thomas, C. A., Jr., Local Destabilization of DNA During Transcription 1

Cramer, J. H., Bhargava, M. M. and Halvorson, H. O., Isolation and Characterization of γ DNA of *Saccharomyces cerevisiae* 11

Adesnik, M., Salditt, M., Thomas, W. and Darnell, J. E., Evidence that all Messenger RNA Molecules (except Histone Messenger RNA) contain Poly(A) Sequences and that the Poly(A) has a Nuclear Function 21

Connors, P. G. and Beeman, W. W., Size and Shape of 5 s Ribosomal RNA . 31

Schechter, A. N., Sachs, D. H., Heller, S. R., Shrager, R. I. and Cohen, J. S., Nuclear Magnetic Resonance Titration Curves of Histidine Ring Protons. III. Ribonuclease 39

Sundaralingam, M. and Arora, S. K., Crystal Structure of the Aminoglycosyl Antibiotic Puromycin Dihydrochloride Pentahydrate. Models for the Terminal 3′-Aminoacyladenosine Moieties of Transfer RNA's and Protein–Nucleic Acid Interactions 49

Berry, R. W. and Shelanski, M. L., Interactions of Tubulin with Vinblastine and Guanosine Triphosphate 71

Wu, M., Davidson, N., Attardi, G. and Aloni, Y., Expression of the Mitochondrial Genome in HeLa Cells. XIV. The Relative Positions of the 4 s RNA Genes and of the Ribosomal RNA Genes in Mitochondrial DNA . 81

Krakow, W., Endres, G. F., Siegel, B. M. and Scheraga, H. A., An Electron Microscopic Investigation of the Polymerization of Bovine Fibrin Monomer 95

Letters to the Editor—

Cole F. E. and Parthasarathy, R., The Trypsin–Trypsin Inhibitor Complex: Crystallization, Unit Cells and Space Groups . . . 105

Fraenkel, D. G. and Parola, A., "Up-promoter" Mutations of Glucose 6-phosphate Dehydrogenase in *Escherichia coli* 107

NUMBER 2, 14 NOVEMBER 1972

DONELLI, G., GUGLIELMI, F. and PAOLETTI, L., Structure and Physico-chemical Properties of Bacteriophage G. I. Arrangement of Protein Subunits and Contraction Process of Tail Sheath 113

WORCEL, A. and BURGI, E., On the Structure of the Folded Chromosome of *Escherichia coli* 127

JACKSON, E. N. and YANOFSKY, C., Internal Deletions in the Tryptophan Operon of *Escherichia coli* 149

DUBIN, D. T. and FRIEND, D. A., Comparison of Cytoplasmic and Mitochondrial 4 s RNA from Cultured Hamster Cells: Physical and Metabolic Properties 163

STORRIE, B. and ATTARDI, G., Expression of the Mitochondrial Genome in HeLa Cells. XIII. Effect of Selective Inhibition of Cytoplasmic or Mitochondrial Protein Synthesis on Mitochondrial Nucleic Acid Synthesis . 177

LEONARD, K. R., KLEINSCHMIDT, A. K., AGABIAN-KESHISHIAN, N., SHAPIRO, L. and MAIZEL, J. V., JR., Structural Studies on the Capsid of *Caulobacter crescentus* Bacteriophage ϕCbK. 201

NINIO, J., LUZZATI, V. and YANIV, M., Comparative Small-angle X-ray Scattering Studies on Unacylated, Acylated and Cross-linked *Escherichia coli* Transfer RNA_I^{Val} 217

MOTHERWELL, W. D. S. and ISAACS, N. W., Packing Patterns of Crystalline Purine Nucleosides: a Study in Terms of Empirical van der Waals Energy 231

REMAUT, E. and FIERS, W., Studies on the Bacteriophage MS2. XVI. The Termination Signal of the A Protein Cistron 243

ZITOMER, R. S. and FLAKS, J. G., Magnesium Dependence and Equilibrium of the *Escherichia coli* Ribosomal Subunit Association 263

SZILÁGYI, J. F. and PRINGLE, C. R., Effect of Temperature-sensitive Mutations on the Virion-associated RNA Transcriptase of Vesicular Stomatitis Virus 281

PAETKAU, V., COULTER, M. B., FLINTOFF, W. F. and MORGAN, A. R., Thymine·Guanine Base Pairing during Transcription of Polydeoxypyrimidines *in vitro* 293

BELLEMARE, G., JORDAN, B. R. and MONIER, R., Demonstration of a Highly Exposed Region in *Escherichia coli* 5 s RNA by Partial Hydrolysis with Ribonuclease IV and Sheep Kidney Nuclease 307

GERBER, B. R., ROUTLEDGE, L. M. and TAKASHIMA, S., Self-assembly of Bacterial Flagellar Protein: Dielectric Behavior of Monomers and Polymers 317

KAISER, I. I., Thiobases in 5-Fluorouracil-containing Transfer RNA from *Escherichia coli* 339

SCHRÖDER, C. H. and KAERNER, H.-C., Replication of Bacteriophage ϕX174 Replicative Form DNA *in vivo* 351

EGAN, J. B. and HOGNESS, D. S., The Topography of Lambda DNA: Isolation of Ordered Fragments and the Physical Mapping of Point Mutations . . 363

CHAMPOUX, J. J. and HOGNESS, D. S., The Topography of Lambda DNA: Polyriboguanylic Acid Binding Sites and Base Composition 383

HENNIG, W., Highly Repetitive DNA Sequences in the Genome of *Drosophila hydei*. I. Preferential Localization in the X Chromosomal Heterochromatin 407

HENNIG, W., Highly Repetitive DNA Sequences in the Genome of *Drosophila hydei*. II. Occurrence in Polytene Tissues 419

EBEL-TSIPIS, J., BOTSTEIN, D. and FOX, M. S., Generalized Transduction by Phage P22 in *Salmonella typhimurium*. I. Molecular Origin of Transducing DNA 433

EBEL-TSIPIS, J., FOX, M. S. and BOTSTEIN, D., Generalized Transduction by Bacteriophage P22 in *Salmonella typhimurium*. II. Mechanism of Integration of Transducing DNA 449

SHARP, P. A., HSU, M.-T., OHTSUBO, E. and DAVIDSON, N., Electron Microscope Heteroduplex Studies of Sequence Relations among Plasmids of *Escherichia coli*. I. Structure of F-prime Factors 471

LETTERS TO THE EDITOR

SHARP, P. A., HSU, M.-T. and DAVIDSON, N., Note on the Structure of Prophage λ 499

SAWYER, L., A Fourth Crystal Form of Rabbit Muscle Aldolase . . 503

ROBILLARD, G. and SHULMAN, R. G., High Resolution Nuclear Magnetic Resonance Study of the Histidine–Aspartate Hydrogen Bond in Chymotrypsin and Chymotrypsinogen 507

COHEN, J. S., HAGENMAIER, H., POLLARD, H. and SCHECHTER, A. N., Proton Magnetic Resonance Study of the Histidine Residues of Sperm Whale and Horse Myoglobins 513

ERRATA 521

NUMBER 3, 28 NOVEMBER 1972

BRETSCHER, M. S., Phosphatidyl-ethanolamine: Differential Labelling in Intact Cells and Cell Ghosts of Human Erythrocytes by a Membrane-impermeable Reagent 523

Gausing, K., Efficiency of Protein and Messenger RNA Synthesis in Bacteriophage T4-infected Cells of *Escherichia coli* 529

Wilson, J. H., Kim, J. S. and Abelson, J. N., Bacteriophage T4 Transfer RNA. III. Clustering of the Genes for the T4 Transfer RNA's . . 547

Pisetsky, D., Berkower, I., Wickner, R. and Hurwitz, J., Role of ATP in DNA Synthesis in *Escherichia coli* 557

Hyman, R. W. and Summers, W. C., Isolation and Physical Mapping of T7 Gene *1* Messenger RNA 573

Kaempfer, R., Initiation Factor IF-3: a Specific Inhibitor of Ribosomal Subunit Association 583

Simmons, D. T. and Strauss, J. H., Replication of Sindbis Virus. I. Relative Size and Genetic Content of 26 s and 49 s RNA 599

Simmons, D. T. and Strauss, J. H., Replication of Sindbis Virus. II. Multiple Forms of Double-stranded RNA isolated from Infected Cells . . . 615

Sutton, W. D. and McCallum, M., Related Satellite DNA's in the Genus *Mus* 633
Appendix—Sutton, W. D., DNA–DNA Reassociation Reactions driven by an Excess of One Component 652

Prives, C. L. and Silverman, P. M., Replication of RNA Viruses: Structure of a 6 s RNA synthesized by the Qβ RNA Polymerase . . . 657

Mertes, M., Peters, M. A., Mahoney, W. and Yarus, M., Isoleucylation of Transfer RNA$_f^{Met}$ (*E. coli*) by Isoleucyl-transfer RNA Synthetase from *Escherichia coli* 671

Forchhammer, J., Jackson, E. N. and Yanofsky, C., Different Half-lives of Messenger RNA corresponding to Different Segments of the Tryptophan Operon of *Escherichia coli* 687

Craig, E., Cremer, K. and Schlessinger, D., Metabolism of T4 Messenger RNA, Host Messenger RNA and Ribosomal RNA in T4-infected *Escherichia coli* B 701

Crawford, I. P. and Preiss, J., Distribution of Closely Linked Markers following Intragenic Recombination in *Escherichia coli* 717

Cornibert, J. and Marchessault, R. H., Physical Properties of Poly-β-Hydroxybutyrate. IV. Conformational Analysis and Crystalline Structure 735

Vibert, P. J., Haselgrove, J. C., Lowy, J. and Poulsen, F. R., Structural Changes in Actin-containing Filaments of Muscle 757

Fiil, N. P., von Meyenburg, K. and Friesen, J. D., Accumulation and Turnover of Guanosine Tetraphosphate in *Escherichia coli* 769

LETTERS TO THE EDITOR

DOBLER, M., DOVER, S. D., LAVES, K., BINDER, A. and ZUBER, H., Crystallization and Preliminary Crystal Data of *C*-Phycocyanin . 785

SIGAL, N. and ALBERTS, B., Genetic Recombination: The Nature of a Crossed Strand-exchange between Two Homologous DNA Molecules 789

MESELSON, M., Formation of Hybrid DNA by Rotary Diffusion during Genetic Recombination 795

ODA, T. and TAKANAMI, M., Observations on the Structure of the Termination Factor Rho and its Attachment to DNA . . . 799

EAGLES, P. A. M., IQBAL, M., JOHNSON, L. N., MOSLEY, J. and WILSON, K. S., A Tetragonal Crystal Form of Phosphorylase *b* . . . 803

MORITA, Y. and IDA, S., A Preliminary Crystallographic Investigation of Rice Cytochrome *c* 807

BERTHOU, J., CESBRON, F. and LAURENT, A., A new Experimental Method for the Direct Determination of the Water Content of Protein Crystals 809

BERTHOU, J., LAURENT, A. and JOLLÈS, P., Preliminary X-ray Investigation of Duck Egg-white Lysozyme II 815

CZERWINSKI, E. W., MATHEWS, F. S., HOLLENBERG, P., DRICKAMER, K. and HAGER, L. P., Crystallographic Study of Cytochrome b_{562} from *Escherichia coli* 819